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The New Mexico Child Care Health Promotion Project: Theory, Methods, and Results 1989-1992

Elias J. Duryea, Irene Sanchez, Liza Nagel

Elias J. Duryea, PhD, is a professor in the Health Education Program in the College of Education at the University of New Mexico in Albuquerque, New Mexico.

Irene Sanchez, PhD, is a Program Associate in the Family Nutrition Bureau in the Department of Families, Youthe, and Children at the New Mexico Department of Health in Santa Fe, New Mexico.

Liza Nagel, PhD, is an assistant professor in the Health Education Program in the College of Education at the University of New Mexico in Albuquerque, New Mexico.

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Introduction

With an increasing number of women entering the work force each year, the role of primary caretaker is being redefined to include grandparents and other adults. Put simply, increasing numbers of children are spending their developmental years in the care of someone other than their parents. The issue of child care has arrived on the nation's agenda, and the need for quality child care is now recognized as a national priority (Martin, Ramey, & Ramey, 1990).

More children are spending their early developmental years in a variety of child care environments such as Head Start Programs, private centers, day care homes, or in relatives' homes. The child's care provider is seen as a crucial partner in shaping the child's social, mental, emotional, as well as physical health. This is especially critical for language minority children who may not have the same opportunity for enhancing their well-being as their English-speaking counterparts.

National surveys suggest that as many as 25 percent of the nation's preschool children live in poverty (U.S. Bureau of Census, 1987). In New Mexico, over 40 percent of the Native American population and nearly 25 percent of the Hispanic population exist in poverty. For Native American children between 1 and 4 years of age, injury-related deaths occur at nearly three times the rate of the same age group among the general population in the United States (Berger & Kitzes, 1989). The leading causes of death in this age group (1-4 years old) are injury related, mostly due to motor vehicle collisions associated with adult consumption of alcohol (New Mexico Department of Health, 1993). A protected and healthy child care population has

become a goal for the nation as well as for the State of New Mexico.

An Innovative Response

New Mexico is a rural, sparsely populated state, rich in culture and history, but relatively poor when compared with the rest of the nation. New Mexico's children rank among the poorest in the country (New Mexico Coalition for Children, 1987). The population of New Mexico is comprised of three major ethnic groups. Non-Hispanic Whites comprise 53 percent of the population, Hispanics make up 36 percent, Native Americans comprise 8 percent, and Blacks and others make up the remainder (New Mexico Department of Health, 1993). New Mexico is the nation's most ethnically diverse state.

In August of 1992, New Mexico had 400 licensed day care centers and 6000 licensed day care homes. The New Mexico Coalition for Children (1987) estimated that over 35,000 children are enrolled in some type of child care setting in the state. An undetermined number of children spend their days in unlicensed, unregistered homes or in the care of a relative.

The New Mexico Child Care Health Promotion Project (NMCCHPP) was initiated to address the health status as well as health promotion needs of rural Native American and Hispanic children ages 1-5 served in child care centers in two frontier counties of northwestern New Mexico. The United States Census Bureau (1989) describes a "frontier" county as one with fewer than four citizens per square mile. These two counties, one primarily Native American and the other mostly Hispanic, were selected based on socioeconomic status, health, and social service indicators (New Mexico Department of Health, 1993). The health problems of these children include dental problems, poor nutritional status resulting in underweight and stunting, communicable diseases, and lack of opportunities for developing fitness and health-promoting behaviors (New Mexico Department of Health, 1993).

Purpose

The intent of this three-year project was to provide training for child care providers (teachers, aides) related to health behaviors and preventive health care of preschool children. The specific purpose of the study was to reduce the proportion of teachers requiring training in identified areas. Additionally, training focused on how to foster self-esteem, ways to work more effectively with disabled children, and how to integrate ethnic culture and tradition into nutrition as well as fitness activities. Finally, a parent involvement component was developed so project instruction (i.e., teacher education) could receive reinforcement at home.

Conceptual Foundations

The design of the project followed the theoretical precepts of social cognitive theory (Rosenstock, Strecher, & Becker, 1988) and the diffusion of innovations framework (Rogers, 1994). Social cognitive theory suggests that behavior can be learned if environments are supportive and reinforcing, one's sense of self-efficacy is enhanced, and positive models are used. Project activities were designed upon this specific conceptualization of behavior change. For example, participating schools were encouraged to develop health enhancing media as well as more healthful food choices for children and care providers. Classroom activities were designed to strengthen self-efficacy of the children in a variety of health behavior areas (i.e., fitness participation, dental habits). Care providers were given information and practice on being health-promoting models for their children (i.e., drinking fruit juices instead of soda at lunch with the children).

Diffusion theory states that an innovation (i.e., program, curriculum) will be more readily disseminated

through a system (county) and adopted if specific factors or characteristics are built into the innovation. First, the innovation must be viewed as compatible with the potential adopter's belief and value structure. Second, it must not be seen as confusing or complex. Third, adopters should be able to try it out in a situation free of pressure to adopt. Fourth, adopters should not feel that being observed participating in the innovation or using it will cause them consternation or regret. Finally, and most crucial to the intervention's success, the innovation must be perceived by adopters as possessing relative advantage over that which is currently being used. This advantage may take virtually any form and can be tangible (economic savings) or simply perceived, but it is central to increasing the adoption rate. Each of the project activities as well as the total curriculum itself was developed in concert with the precepts of these two theories.

Methods

Project staff were hired and began designing and testing the project instruments and activities in April, 1990. The first six months of year 1 and the first seven months of year 2 were spent cultivating community support for the project by arranging a series of small conferences with regional care providers from both counties. Baseline data were collected from state and local records on the children's immunization history, height, weight, prevalence of dental caries, vision, hearing, stunting, and anemia. Data documenting general overall health including health problems, health referrals, and nutritional and developmental status of the children were also collected at year 1 and at year 2 of 3 depending on administrative access and availability. The centers varied greatly in the degree of record completeness.

In addition to the health histories of the children, baseline data were collected at the inception of the project and again at project end (year 3) for perceived training needs and for knowledge of care providers and health aides. Results are presented only for these two areas.

Baseline

Perceived Training Needs
A four-point scale was employed to examine perceived training needs of teachers by developing items central to perceived training needs after consultation with experts from Head Start Centers employed within the targeted areas (see example below).

Item #4: How to work with handicapped children so they participate and interact:			
A Good Deal	Some More	A Little More	No More
More Training	Training	Training	Training

The collected data were subjected to principle components analysis (PCA) to ascertain which training needs were most strongly desired. Tables 1 and 2 report data for the most strongly desired training needs.

Knowledge
A five - point Likert scale was employed to estimate teachers' knowledge of children's health behaviors and preventive measures in day care centers (see example below).

Item #67: Dried fruits such as raisins should be avoided as a between meals snack:

Strongly Strongly	Agree	Not Sure	Disagree	Strongly Disagree

The specific knowledge areas (item domains) were derived after consultation with project consultants, literature reviews, and area Head Start personnel.

Posttest
The posttest employed the same survey instrument as the pretest. Using a computer-generated randomization program (Table of Random Numbers) a representative sample was selected from the pretest data set (n=48) and from the posttest data set (n=48) (Snedecor & Cochran, 1967). Both perceived training needs and knowledge were then subjected to Dependent (paired) t-Tests using the Systat statistical program. A $p<.05$ was employed as the probability level for statistical significance.

Intervention Strategies
The intervention strategies for the project were derived after consultation with experts in the preschool field, an examination of prior literature, and giving a series of small pilot tests. The eventual project treatment included five main approaches:
1. **Conducting health assessments of children in child care settings and during community health fairs by developing a health assessment manual for child providers.** Early in the project, the lack of standardization in conducting health assessments was identified as a major problem. A training manual was subsequently developed for use in child care settings. Another problem was thelack of proper equipment for weighing and measuring children. Child care providers were instructed about which type of steel measuring tapes and balance beam scales should be purchased. In some cases, the project purchased these items for loan to centers and homes for weighing and measuring the children. Health Fairs were conducted in each county, and approximately 1,000 children were assessed. The health coordinators employed by the Head Start Program played a key role in organizing and conducting the health fairs in their local communities.

2. **Training of child care providers in the areas of nutrition, dental health, mental health, and physical fitness.** Besides workshops for providers, the training included modeling of activities for staff in child care settings and field testing concepts (i.e., eating nutritious foods in front of the children) and activities (i.e., exercising or playing with the children during recess). Initial training was conducted for child care providers in each county resulting in approximately 2,500 providers trained over the three years of the project. Separate area-specific, bilingual training manuals were developed by the nursing, dental, physical fitness, and mental health consultants for use in the staff trainings. Some workshops were conducted in Navajo by personnel from the Navajo Nation associated with the project. Approximately 12,000 children were affected by the training and companion materials provided to their care givers.

3. **Development and implementation of a health promotion curriculum in the child care setting.** In collaboration with health professionals, child care providers, and project consultants, a health promotion curriculum was developed, revised, and implemented in participating Head Start programs, private child care centers, and day care homes. Activities for the curriculum and training models were field tested in each of the two counties in a variety of settings including Head Start classrooms, private centers, and training sessions for child care providers and parents.

4. **Development and implementation of an education and training program for parents of children in child care settings.** During the first year of the project, child care providers identified a strong need for a

parent component. Project staff and consultants subsequently developed and implemented a specialized training program for parents. This component addressed the following: importance of nutrition, role of parents as models and primary teachers of health habits, methods for helping young children enhance their self-esteem, effects of television on young children, as well as basic strategies to enhance the social and emotional development of children. Since progress in helping children establish good health habits would be better achieved if the parental component was complementary to the school's curriculum, parents received information and training similar to that provided to their children's teachers. A total of 500 parents received the training component.

Results

Perceived Training Needs and Knowledge
Results are presented for the perceived training needs and knowledge levels of teachers. Tables include calculated t-values, standard deviations, and related data for the analysis of pretest and posttest results for these two areas. This analysis allows for a comparison of mean scores from pre- to posttest. Such a procedure was conducted for each perceived training need and knowledge area.

Table 1 describes the effects of the program intervention upon teachers' perception of training needs in three areas. Item 3 asked teachers, "How much training do you think you need in how to manage a child who continually fights?" By posttest there was a statistically significant ($p<.05$) shift away from teachers still reporting that they needed a good deal more training on this subject (17 percent compared to 4 percent).

Item 14 addressed the topic of integrating ethnic foods into nutrition activities. As shown in Table 1, there was a statistically significant ($p<.05$) and favorable decrease by posttest in responses requesting a "good deal more" training on this topic (25 percent compared to 13 percent). There was also a concomitant decrease in responses requesting "some more" training by posttest (35 percent compared to 29 percent).

Item 18 examined the area of working with children with disabilities. By posttest only 4 percent of respondents still reported needing a "good deal more" training in this vital area. Those still needing "some more" training decreased from twenty-five to nineteen percent.

Table 1. Perceived Training Needs of Daycare Providers (n=48)

ACTUAL QUESTIONNAIRE ITEMS				
How much training do you think you need in:	(1)	(2)	(3)	(4)
	Good Deal More	Some More	A Little More	No More
	no. (%)	no. (%)	no. (%)	no. (5)
#3 How to manage a child who continually fights?				
Pretest	8(17)	14(29)	17(35)	9(19)
Posttest	2(4)	11(23)	19(40)	16(33)
SD = 1.398				
t Value = 2.271				
DF = 47.000				

P<.05				
#14 How to integrate ethnic foods into nutrition activities?				
Pretest	12(25)	12(35)	13(27)	6(13)
Posttest	6(13)	14(29)	13(27)	8(17)
SD = 1.399				
t Value = 2.154				
DF = 47.000				
P<.05				
#18 How to work with children with disabilities?				
Pretest	9(18)	12(25)	14(29)	13(27)
Posttest	2(4)	9(19)	16(33)	21(44)
SD = 1.237				
t Value = 3.034				
DF = 47.000				
P<.05				

Table 2 presents data related to dental knowledge gains at posttest. The need to encourage preventive dental health behavior was examined in Item 28. By posttest only 4 percent of respondents still disagreed with the correct statement, "Children even as young as 2 should be shown how to brush their teeth by themselves just to get used to it."
Items 30 and 31 present results for two issues also dealing with dental health ("Normally, a 3 year old has 20 primary [baby] teeth." and "Children should clean their teeth after every meal and at bedtime."). By posttest, item 30 had no respondents disagreeing with this factual statement, and the percent responding "not sure" decreased from 33 to 15 percent. Item 31 had similarly favorable responses at posttest.

Table 2. Day Care Providers' Knowledge of Children's Dental Health Behaviors

ACTUAL QUESTIONNAIRE ITEMS					
How much training do you think you need in:	(1)	(2)	(3)	(4)	(5)
	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
#28 Children even as young as 2 should be shown how to brush their teeth by themselves just to get used to it.					
Pretest	15(31)	24(50)	2(4)	5(10)	2(4)
Postest	48(63)	18(33)	2(0)	2(4)	0(0)
SD = 1.233					
t Value = 3.950					
DF = 47.000					
P<.05					

#29 When bacteria that live normally in the mouth come in contact with sugar, they make an acid which dissolves the teeth.					
Pretest	8(17)	21(44)	12(25)	6(13)	1(2)
Postest	19(40)	22(46)	3(6)	3(6)	1(2)
SD = 1.351					
t Value = 2.884					
DF = 47.000					
P<.05					
#30 Normally, a 3 year old has 20 primary (baby) teeth.					
Pretest	5(10)	20(42)	16(33)	7(15)	0(0)
Postest	17(35)	24(50)	7(15)	0(0)	0(0)
SD = 1.339					
t Value = 3.556					
DF = 47.000					
P<.05					
#31 Children should clean their teeth after every meal and at bedtime.					
Pretest	23(48)	22(46)	0(0)	2(4)	1(2)
Postest	38(79)	10(21)	0(0)	0(0)	0(0)
SD = 1.091					
t Value = 3.042					
DF = 47.000					
P<.05					

Table 3 presents data related to working with disabled children, discipline, and selected prevention areas. Item 25 presents data related to appropriate first aid in a specific crisis situation. As shown, at pretest, 11 percent of the respondents "strongly disagreed" with the true statement, "A child has just cut him/herself, the first thing you should do is apply direct pressure on the cut." This was corrected by posttest as shown by no teacher reporting the incorrect response. Unfortunately, we found only a 4 percent reduction in those in the disagree category with this statement at posttest (17 percent compared to 13 percent).

Item 26 presents the results on items dealing with appropriate care of an infected child. Again by posttest, respondents agreed with the correct statement (i.e., favorable response) at a statistically higher level (56 percent) than at pretest (27 percent).

Item 32 examined the management of handicapped children. As with dental knowledge, at the project's end few respondents still disagreed with the correct statement, "Despite a child's handicap you should attempt to treat the child just like the other children" (8 percent compared to 2 percent).

Item 33 addressed the area of classroom discipline, and by posttest marginal gains were made on this objective, although some respondents still clung to the philosophy that such children should simply be

ignored. This was shown by 14 percent still agreeing or strongly agreeing with this statement at posttest. Attributions for why this result persisted might be explained by future qualitative replication studies using interviews.

Table 3. Day Care Providers' Knowedge of Preventive Care Measures

ACTUAL QUESTIONNAIRE ITEMS					
	(1)	(2)	(3)	(4)	(5)
	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
#25 A child has just cut him/herself, the first thing you should do is apply direct pressure on the cut.					
Pretest	13(27)	17(35)	5(10)	8(17)	5(11)
Posttest	20(24)	18(38)	4(8)	6(13)	0(0)
SD = 1.760					
t Value = 2.296					
DF = 47.000					
P<.05					
#26 A child comes to school with bright red eyes that burn and itch and have mucous in them; you should isolate that child from the rest of the children immediately.					
Pretest	13(27)	20(42)	7(15)	6(13)	2(4)
Posttest	27(56)	18(38)	1(2)	2(4)	0(0)
SD = 1.473					
t Value = 3.333					
DF = 47.000					
P<.05					
#32 Despite a child's handicap you should attempt to treat the child just like the other children.					
Pretest	17(35)	23(48)	2(4)	2(4)	4(8)
Posttest	34(70)	11(22)	1(2)	1(2)	1(2)
SD = 1.76					
t Value = 2.700					
DF = 47.000					
P<.05					
#33 Children who are continually fighting, biting, or totally disruptive in the class should be ignored if all else fails.					

Pretest	4(8)	9(19)	6(13)	19(40)	10(21)
Posttest	2(4)	5(10)	5(10)	11(23)	25(52)
SD = 1.845					
t Value = 2.660					
DF = 47.000					
P<.05					

Discussion

The New Mexico Child Care Health Promotion Project was a regional three- year health enhancement innovation aimed at improving the skill and knowledge levels of day care teachers and aides in two primarily Native American and Hispanic counties in New Mexico. There was no assessment of skill and knowledge differences by site (i.e., Hispanic versus Native American).

The vehicle for achieving the aim of increased skill and knowledge among participants was through the diffusion of culturally relevant health promotion instruction and training for both teachers and parents in a wide array of health status and health content areas. The project, adhering to social cognitive theory principles, integrated Native American and Hispanic models and community leaders throughout project design, implementation, and evaluation stages.

This collaboration ultimately resulted in 4,506 care providers trained in health screening and referral procedures as well as the health promotion curriculum. It is estimated that from such training over 15,000 children at participating day care sites were affected. In large, rural, and relatively poor states like New Mexico the importance of reaching underrepresented populations, especially the very young, cannot be overstated. Diffusion theory proposes that innovations (curricula) will be more readily adopted when participants perceive the relative advantage of the innovation. The principle of demonstrating an innovation's relative advantage was integrated throughout the New Mexico Child Care Health Promotion Project. The target audience for this project was rural, multicultural daycare centers. The results presented here also support the use of social cognitive theory in designing culturally relevant curricular activities for these populations. Scores of teachers and parents from both counties consistently remarked on the project's worth and utility. Very little theory-based research exists which tests how well curricular innovations will be accepted by rural ethnic minority populations. With the primary prevention emphasis proposed by the Clinton Administration for the coming decade, the results of this project indicate isolated and culturally based ethnic minority health promotion implemented at this early developmental level can be successful.

The data from this project, though encouraging, have potential limitations. While principle components analysis (PCA) showed areas in which care providers thought they required more training, the data are based on self-report and thus subject to error effects. We tried to guard against this by running the instrument through a series of field tests before surveying the teachers. Since counties differed substantially by race, culture, and language the potential for misinterpretation of various items must be acknowledged. The project team attempted to lessen this possibility by having Navajo as well as Hispanic project advisors help draft survey items and appropriate language. In certain Native American areas a Navajo helped translate survey items for teachers who had some difficulty understanding certain items.

Similar to results in most comparable projects, the NMCCHPP did not achieve complete or absolute success

across all outcomes. Baby bottle tooth decay, low immunization levels, and other areas in the project area remain concerns for New Mexico health authorities. As national expert panels like the National Health/Education Consortium (NHEC) and Center for Demographic Policy have reported, children living in poverty have an increased risk for a wide array of health and social problems. We hope the NMCCHPP has helped reduce this unacceptable risk for our very young.

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